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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,151	10/06/2003	Naomasa Shiraishi	032136.09	3620
25944	7590	04/22/2005		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER MATHEWS, ALAN A	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 04/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/679,151

Applicant(s)

SHIRAISHI, NAOMASA

Examiner

Alan A. Mathews

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30 and 42-92 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 30, 58, 59, 62, 63, 75-84 and 88 is/are allowed.
- 6) ☒ Claim(s) 42-57, 60, 61, 64-74, 85-87 and 89-92 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/423,457.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/08/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 42-45, 46/45-42, 47-50, 51/50-47, 52, 53, 54/53/52, 54/52, 55, 56, 57/56/55, 64/56/55/53/52/50-47/45-42, 65-68, 70 – 74, 85-87, and 89-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese publication by Horiuchi et al. (61-91662) in view of Jewell et al. (U. S. Patent No. 4,947,413). The Japanese publication by Horiuchi et al. discloses in figure 5 a primary light source 1 (such as a mercury lamp), an illumination system 11, 4, 5, 9, 12, and 7 having means for forming with light from the primary light source 1, a secondary light source having decreased intensity portions at a center thereof and on first and second axis defined to intersect with each other at the center and defined along a first and second direction for illuminating the fine pattern on the mask or reticule 8 (see Figure 5). The Japanese publication by Horiuchi et al. further discloses a projection optical system 14 for projecting on a wafer or substrate 15 the fine pattern on the mask which is illuminated with light from the secondary light source (see page 4, lines 38 – 42 of the translation). The Japanese publication by

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Horiuchi et al. further discloses on page 7; lines 31-35, and page 10, lines 25 – 32 of the English translation that using only the light on the periphery of the secondary light source to illuminate the fine pattern on the mask or reticule 8 further increases the resolution of the image of the pattern produced on the wafer or substrate 15. The Japanese publication by Horiuchi et al. achieves the desired peripheral light pattern by positioning a special diaphragm or aperture plate 9 (Figure 3) at the light exit side of the optical integrator 5 (Figure 5) which blocks the secondary light at the center of the optical axis thereby creating decreased or zero light intensity at the center of optical axis and along the axes or radials that extend out from the center of the optical axes. It is submitted that the claim is of such breadth that it is not limited to the fine pattern of the mask extending along the X and Y axes (i.e. 0 degrees to 180 degrees orientation for the X axis and 90 degrees to 270 degrees orientation for the Y axis) respectively, and that the first and second directions of said fine patterns could extend along the 170 degree, 350 degree radials for the X axis and 80 degrees, 260 degree radials for the Y axis, respectively, from the center of the optical axis of the imagewise projection or micro-device manufacturing device, as recited in claims 64/56/55/53/52/50-47/45-42, for example, of Horiuchi et al. Furthermore, it is submitted that the Japanese publication by Horiuchi et al. (page 8, lines 16-19 of the English translation) suggests to one having ordinary skill in the art that the number of apertures along the periphery of the special diaphragm can be greater or less than that shown in Figure 3 (i.e. four apertures) since the apertures are created by opening holes in the metal plate. Accordingly, it is submitted that it is obvious to one having ordinary skill in the art that the apertures in diaphragm 9 of Horiuchi et al. could be positioned at the 2 o'clock; 4 o'clock; 8 o'clock and 10 o'clock positions, respectively, and that such a positioning would result in the light intensity of the

secondary light source being distributed in four quadrants defined by the center or optical axis and the first and second axes, as recited in claim 91, for example. It is further submitted that it is obvious to one having ordinary skill in the art that the light intensity of the portions of the secondary light sources which pass through the apertures on the outer periphery of the special aperture plate 9 of the Japanese publication by Horiuchi et al. will inherently decrease to about zero at the center of optical axis of said aperture plate 9, as recited in claim 50, since the light transmittance is disclosed on page 8, lines 4-12 of the English translation of Horiuchi et al. as being completely blocked when approaching the center. With respect to claim 52, when the aperture stop shown in figure 2 is substituted for aperture stop 9 in figure 5, the resulting light will illuminate the mask (reticule) pattern at an oblique angle. With respect to claim 70, it is submitted that it logically follows that if the light intensity of the secondary light source decreases at the center of the aperture plate 9 of Horiuchi et al. , the light intensity of the secondary light source increases as the distance from the center of said aperture plate increases. With respect to claims 73, 74, and 86, Horiuchi et al. would have focusing means for element 7, which would relatively move the projected image and the substrate along an optical axis of a projection system.

Thus, Horiuchi et al. discloses the claimed invention except for the specific use of a fine pattern for the mask or reticule which has linear features extending in orthogonal first and second directions.

The patent to Jewell et al. shows that it is well known in the art to provide the reticule or mask 18 (Figure 2) of an imagewise projection device with a fine pattern D (Figure 2) having linear features extending in orthogonal first and second directions as well as numerous other fine

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linear patterns and that the resolution of these fine patterns is a problem that can be solved by different techniques (see column 1, lines 20-21; column 2, lines 45-52; and column 4, line 39 through column 5, line 2). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use a fine pattern having linear features extending in orthogonal first and second directions as the fine pattern for the mask or reticule in the Japanese publication by Horiuchi et al. in view of Jewell et al. for the purpose of improving the resolution of the image projected onto the wafer and thus producing a more accurate final product.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 60, 61, 64/42-45, 64/47-50, 64/52, 64/53, 64/55, 64/56, 64/58-63, and 65-69 are rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese publication by Horiuchi et al. (61-91662). The Japanese publication by Horiuchi et al. (61-91662) discloses in figures 3 and 5 and page 4, lines 38-40 of the English translation, a fine pattern on original (reticule) 8. Figure 5 discloses illumination system 11, 4, 5, 9, 12, and 7 for illuminating the fine pattern on 8. Figure 3 discloses the special diaphragm or aperture plate 9 which can be placed between elements 4 and 5 in figure 5. The aperture plate 9 blocks the light intensity at the center thereof and along a first and second orthogonal axes with respect to the original 8 is to be placed. With

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respect to claims 64-68, these claims are product-by-process claims, with the product being the microdevice. MPEP 2113 states **that the determination of patentability of a product-by-process claim is based on the product itself. The patentability of a product does not depend on its method of production.** The device or wafer produced in Horiuchi et al. (61-91662) appears to be the same product as produced by claims 64-68. The Examiner can find no difference in the device or wafer produced in either Engelen et al. '666 or Hanzawa than the device or wafer produced by claims 56 and 57. It is noted that MPEP 2113 even gives an example where the process of making the product was allowed, but the product-by-process was rejected. With respect to claim 82, on page 8 of the English translation,

Allowable Subject Matter

5. Claims 30, 58, 59, 62, 63, 75-84, and 88 are allowed.

Conclusion

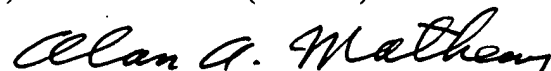
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents cited in the PTO-1449 are cited for the same reasons they were cited in Applicant's IDS.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan A. Mathews whose telephone number is (571) 272-2123. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571) 272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alan A. Mathews
Primary Examiner
Art Unit 2851

AM